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STRATEGIC ASSET-SEEKING ACTIVITIES OF EMERGING MULTINATIONALS: PERSPECTIVES ON FOREIGN ACQUISITIONS BY INDIAN PHARMACEUTICAL MNEs

Jaya Prakash Pradhan*
Sardar Patel Institute of Economic & Social Research, India

Abstract. *While in general, studies on foreign acquisitions by emerging multinationals (EMNEs) have predicted these acquisitions to be driven by both market-seeking and strategic resource-seeking motivations, more concrete analyses on this topic are limited. This paper contributes to the existing literature by analyzing the overseas acquisition activities of EMNEs from Indian pharmaceutical sector. Using the general framework of technological change in emerging economies, Indian pharmaceutical firms are identified to have delicate weakness in their product development capabilities to face intensifying competition in the globalized policy regime. It makes sense for these firms to internationalize through acquisitions of foreign assets that help them not only access new markets but also new products and technologies to overcome their limited product development competencies. The empirical findings highlight the role of host market size, intensity of patenting, skill and liberal FDI policy regime as the key determinants of the geographical distributions of Indian pharmaceutical acquisitions. This implies that EMNEs from Indian pharmaceutical industry are using acquisition as a mixed strategy of accessing markets as well as strategic assets/resources.*

Key words: *Emerging multinationals, Indian pharmaceutical MNEs, overseas mergers and acquisitions, technological change, FDI location choice.*

1. Introduction

The emergence of strategic asset-seeking activities undertaken by firms from emerging economies has been a recent phenomenon and relatively a less explored area in the literature of international production. The number and size of overseas acquisitions by emerging multinationals (EMNEs) are now multiplying rapidly. The mergers and acquisitions (M&A) purchase of emerging economies stood at $120 billion in 2008, accounting for almost 18 per cent of global M&A purchase as against its share of just 4 per cent in 1998 (UNCATD, 2009). This development possesses implications for

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theoretical models of FDI that hitherto concentrated on strategic asset-seeking FDI from developed countries.

Although EMNEs' foreign acquisitions are driven by a set of multiple firm-specific objectives, the motivation of accumulating new technological, marketing and skill capabilities has become a key feature of the current M&A wave from emerging economies like India, China, Korea and Taiwan (Dunning et al., 1996; Deng, 2004; UNCTAD, 2006; Wang & Boateng, 2007; Pradhan, 2008a; Gammeltoft et al., 2010). The concentration of emerging firms' acquisitions in advanced industrialized countries that are relatively more endowed with the knowledge assets lend further support to their strategic asset-seeking motivations. It is also argued that strategic M&As from developing countries representing lagging technical locations are for a technological upgrade or catching up whereas those from developed countries representing leading technical centers are for technological diversification (Cantwell & Janne, 1999).

In the above backdrop, the present study analyzes the recent overseas acquisition activities of EMNEs from Indian pharmaceutical sector. Using the general framework of technological change in developing countries, this paper put forth the perspective that recent overseas acquisitions of EMNEs can partly be related to their initial low product development capabilities at the time of starting of the economic openness programme by the home economy in the early 1990s. With the opening up of the economy to global competition during the last two decades and adoption of product patent regime in 2005, Indian pharmaceutical firms were forced to change the scale and focus of their in-house R&D to increasingly redress their limited product development capabilities. Several studies have confirmed such a tactical shift in the competitive strategy of Indian pharmaceutical companies (Mueller, 2007; Kale & Little, 2007; Chaturvedi et al., 2007). This paper argues that overseas acquisitions by EMNEs from Indian pharmaceutical industry are also pursued for broadening the product development capabilities, besides other firm-specific objectives.

Section 2 presents the framework of technological change in emerging economies for analyzing the development of Indian pharmaceutical sector and identifying the technological gaps that characterizes the long-run growth of the Indian pharmaceutical firms. It emphasizes on the nature of technological change that took place under the protected policy regime and spells out how innovation activities of Indian pharmaceutical firms remain restricted to just process developments. Besides considering the technological and other benefits that overseas acquisitions might have on acquiring Indian pharmaceutical firms, Section 3 focuses on trends and geographical pattern of foreign acquisitions by Indian pharmaceutical companies. Section 4 formulates and estimates a relevant locational model by incorporating different possible motivations of Indian pharmaceutical MNEs behind their foreign acquisition activities. Section 5 summarizes the key findings and provides concluding remarks.

2. Technological Change and Technology Gaps in Emerging Economies

As per the past literature, technology developments in developing countries during the 1970s to the 1980s were more of adaptive innovation associated with imports of foreign technologies (Nelson, 1987; Teitel, 1987). These involve adaptation of imported technology to the local environment, demand and factor conditions and incremental improvements thereon. Some developing countries like South Korea, Taiwan, China, Malaysia, Indonesia, Thailand and Israel succeeded in using the acquired technology to further build up their indigenous capabilities across a wide range of sectors. National firms in these countries leveraged from business-financed R&D characterized by an evolving mix of imitative and innovative technological activities (Bell & Pavitt, 1995). Imitation and reverse engineering provided in the weak patent regime also contributed to technological development of indigenous firms in countries like Korea, Taiwan and China (Lall & Albaladejo, 2003). Adaptive innovation was not just limited to local firms in developing countries. Even foreign firms operating in these countries did mostly adaptive R&D. Lall (1995) argued that foreign firms' R&D "that takes place in developing countries is limited, generally geared to specific adaptive tasks, and concentrated in the few countries with relatively advanced industrial sectors" (p. 120).

Kim (1980) while tracing the evolution of Korean electronic industry, emphasized on the role of imports of foreign technologies and their diffusion/assimilation/imitation in the domestic economy during 1960s–70s as the basis for indigenous technological development. Hobday (1995) highlighted the case of latecomer electronic firms from East Asia (South Korea, Taiwan, Hong Kong and Singapore) that began their technological activities around incremental improvements to acquired foreign technology and later shifted to creative innovation under the export-oriented policy regime. The nature of Indian R&D in the restrictive period of 1970s–1980s was also suggested to be more of adaptive in nature than creative (Desai, 1980; Katrak, 1985). As the R&D in their initial period was mostly adaptive and incremental in a large number of developing or emerging economies, developing country firms are likely to have shortcomings in their product development capabilities.

Therefore, the localized technological change in developing regions mostly remained knowledge accumulation based on reverse engineering and development of cost-effective processes on the eve of the early 1990s. This technology gap of lacking adequate product development capabilities is due partly to their poor R&D infrastructure, weak linkages between business and R&D laboratories, small firm size and a smaller endowment of initial technical knowledge. It is clear that such technology gap and inadequacy in other strategic capabilities might turn out to be a powerful drive for firms from many developing countries, when faced with the policy of openness and increasing competition, to use M&As as seriously as improving their in-house R&D activities to overcome their limited product development capabilities.

A combination of market- and asset-seeking motivations appear to be driving recent M&As by developing country firms (Dunning & Lundan, 2008). Luo and Tung (2007) have explained how emerging market multinationals, given their competitive

weaknesses, are increasingly acquiring strategic assets from mature MNEs in developed countries to overcome their latecomer disadvantage in world markets. Forsans and Balasubramanyam (2010) suggested that access to technology and know-how is one of the main motives behind emerging firms' foreign acquisition from India and China and argued that M&A is a more efficient and inexpensive source of technology than licensing agreements. Rasiah et al. (2010) contended that Indian, Chinese, and Brazilian firms are targeting US more and more for accessing both intellectual properties and markets. Rui and Yip (2008) suggested that Chinese firms are using overseas acquisitions, partly, for acquiring foreign strategic capabilities to offset their competitive disadvantages. Sauvant et al. (2010), Pradhan & Abraham (2005), Pradhan (2008a) and Pradhan & Singh (2009) emphasized the strategic asset-seeking motives of Indian acquiring firms, besides other firm-specific motivations. Buckley et al. (2007), Athreye & Kapur (2009), Rajan (2009), Pradhan (2010; 2011), and De Beule (2010) all have hypothesized about the important role of strategic asset-seeking motivation that drives acquisitions by Chinese and Indian MNEs, of course, in companionship with other crucial objectives like access to markets and natural resources. In the imbalance theory proposed by Moon & Roehl (2001) the rise of FDI by firms with weak competitive resources and from less developed countries is explained as an outcome of the imbalance between a firm's existing resources and those it lacks.

The general model of technological change in developing countries, as presented above, has been applied to the case of Indian pharmaceutical industry in the following section. The basic idea is to appreciate the recent spell of overseas acquisitions by Indian pharmaceutical firms in the overall context of their existing technological strength and weakness.

2.1. Localized Technological Change in Indian Pharmaceutical Industry

The post-Independence growth of Indian pharmaceutical industry and associated technological change can be broadly divided into four phases as shown in Table 1 (Pradhan & Alakshendra, 2006). In the initial phase during 1947–1969, the industry was mostly dominated by foreign firms, which were primarily engaged in trading activities of formulations derived from imported bulk drugs (Chaudhuri, 1997; Kumar & Pradhan, 2003). Due to inadequate domestic capability, the Government intervened by starting public sector enterprises for local manufacturing of essential drugs. Towards the early 1970s, Indian pharmaceutical industry shifted to a new era of growth facilitated by adoption of a process patent regime and preferential policy treatment of domestic enterprises. The period 1970–1989 witnessed the emergence of a growing number of domestic firms occupying increasing share in domestic markets. As the Indian Patent Act 1970 only permitted a process patent for the pharmaceutical products and also for a short duration of just five years from the patent being granted, domestic firms were able to reverse engineer and develop alternative processes for patented drugs in other countries (UNCTAD, 2003). This has contributed to significant accumulation of domestic skills in cost effective process development and rapid growth of the industry

in the 1980s. Technological imitation, reverse engineering and cost-effective process development have come to be regarded as key competitive strategy of domestic firms (Aggarwal, 2007; Patibandla, 2006). Domestic enterprises based on large-scale reverse engineering and process innovation achieved near self-sufficiency in the technology and production of bulk drugs belonging to several major therapeutic groups and developed modern manufacturing facilities for all dosage forms like tablets, capsules, liquids, orals and injectibles.

TABLE 1. **Growth stages of Indian pharmaceutical industry since 1947**

Growth stages	Main Features
I. 1947–1969	• MNEs domination, largely import dependent and minimal export activities. • Insufficient technological base for local production. • Starting of public sector enterprises for local drug production. • Emphasis on general education and skill creation, infrastructure, institution building and planned development.
II. 1970–1989	• Enactment of the Indian Patent Act 1970: Creation and accumulation of firm-specific advantages by domestic firms under this new process patent regime. Imitation, incremental innovation and process development were the basic character of indigenous technological development in the pharmaceutical sector. • Passing of different regulations like FERA and New Drug Policy 1978 to restrict activities of MNEs in the sector. • These policies led to the emergence of a strong domestic sector not only serving domestic market but also interested in entering foreign markets through exports and greenfield outward investments. Trade deficits in pharmaceuticals were consistently reduced.
III. 1990–1999	• Domestic firms now dominate the pharmaceutical industry, which are highly export-oriented contributing to rising trade surpluses. • However, the openness policy and impending shift to product patent regime under the TRIPS and new regulatory requirement like GMP compliance started putting increasing pressures on Indian pharmaceutical companies. • Indian firms started improving their in-house R&D activities with greater emphasis on global manufacturing practices and novel delivery systems. • Apart from outward greenfield investments, Indian firms started exploring overseas acquisitions as another mode of internationalization. • Pharmaceutical contract manufacturing and research services also emerged as a new growth strategy for the industry.
IV. 2000–onwards	• The introduction of product patent regime in 2005 sharply influenced technological strategies of capable Indian firms by increasing focus on product development. Growing sophistication of technological capability of large Indian pharmaceutical firms is reflected in tendency of out-licensing of drugs molecules to global firms. • Rapid growth of overseas acquisitions and increasing incidents of outsourcing including strategic alliances. • Partly, overseas acquisition is a strategy of acquiring new technological assets/ competencies.

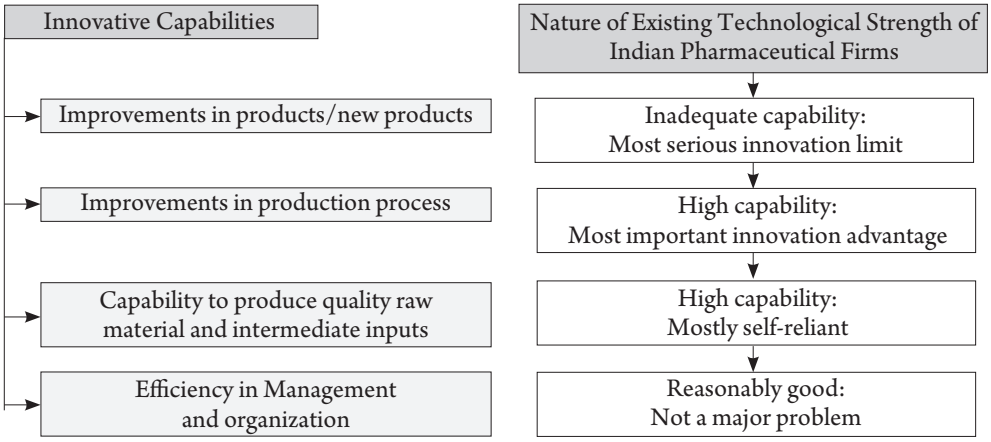
Source: Adapted from Pradhan & Alakshendra (2006)

In the 1990s, Indian pharmaceutical industry continued with spectacular growth performance and impressive trade surpluses. The domestic firms out-competed foreign firms to be the dominant market player as a consequence of their stronger process development capabilities. For instance, in 1991 domestic firms accounted for about 70 and 80 per cent market shares in the case of bulk drugs and formulations respectively (Lanjouw, 1998). The industry turns out to be one of the most export-oriented sectors in Indian manufacturing with more than 30 per cent of its production being exported to foreign markets (Pradhan, 2007). The economic openness policy of the home country and emerging regulatory requirements started forcing a number of Indian pharmaceutical firms to upgrade their manufacturing practices to the global level and expand their R&D focus to devise novel drug delivery systems (Smith, 2000; UNCTAD, 2003). Their main deficiencies of inadequate capabilities to develop new molecules, however, remain to be addressed seriously. The process patent regime has incentivized the process of technological change towards improvements in production process, raw material and intermediate inputs. However, Indian companies had little inducement to undertake research for product developments as other Indian companies can legally launch any new product by simply resorting to another new process. As a result, firm-level capability in product developments was significantly undermined. Also because the new product development involves costly and risky R&D strategy, very few domestic firms could think of pursuing such an innovation strategy (Smith, 2000).

The first decade of the twenty-first century saw profound changes in the technological strategies of Indian pharmaceutical firms. The re-entry of product patent regime on a global scale and strict quality norms in export markets have made Indian firms serious about improving their technological capabilities. The general trend among relatively large Indian pharmaceutical firms was to improve their R&D intensity with some pursuing the goal of developing new molecules. Yet some others decided in favour of joint R&D strategy with developed country firms or entering into contract manufacturing (Pradhan, 2006; Balcet & Bruschieri, 2010). It appears that some of Indian pharmaceutical firms are now trying to go beyond the process development based innovation strategy and to enlarge their product basket. For these firms, depending only on in-house R&D to broaden their product development capabilities is a too restrictive strategy. As they are too far behind their international competitors in terms of the size of product basket and scale of operation, inorganic path to product development capabilities can be as important as R&D. Both the in-house R&D and acquisition of foreign strategic assets can often complement each other, especially when firms possess weak product development capabilities. Therefore, it is not unrealistic to think that the recent overseas acquisitions by Indian pharmaceutical firms could be a result of their strategic competency building intention, in addition to the traditional objectives of accessing new market, efficiency-seeking and increasing global scale of operation.

3. Acquisitions to Mitigate Technological Inadequacies

As discussed above, strategic government interventions have succeeded in building local capability in the pharmaceutical sector but they have also created a number of limitations in pushing forward firm's productivity and technological frontiers (Figure 1). While weaker intellectual property rights stimulated process innovation by Indian pharmaceutical companies in the past, in subsequent period of liberalization such a limited technological strategy emerged as an important obstacle to their growth and learning. It is also evident that Indian domestic pharmaceutical companies' technological advantages remain confined to innovative cost-effective processes, discovery in novel drugs delivery system, self-reliance in producing quality raw materials and production led by quality management. However, these technological strengths are confined to a small group of large Indian pharmaceutical companies (Pradhan & Sahu, 2008).

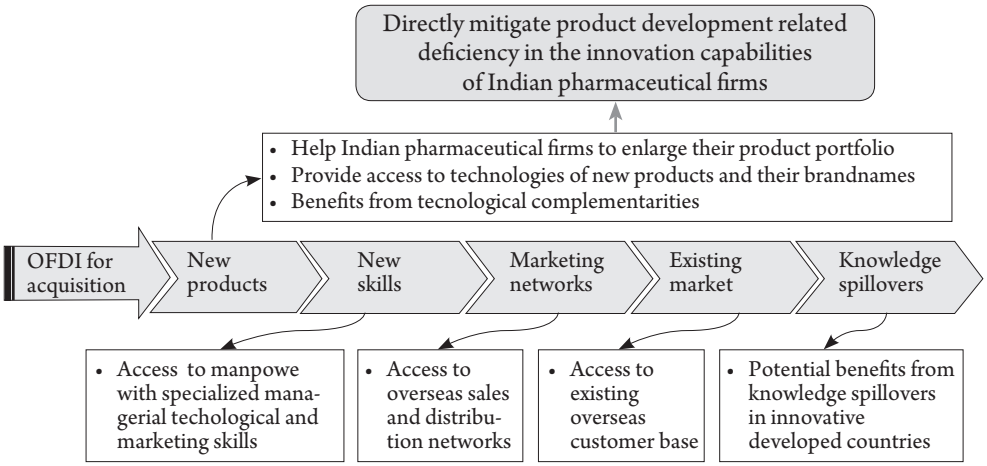


Source: Own construction.

FIGURE 1. **A Simplistic Perspective on Technological Capabilities of Indian Pharmaceutical Firms**

When India opened up to the accelerating process of globalization and openness in the 1990s, Indian pharmaceutical firms became aware of the diminishing advantages of their narrowly focused innovation strategies. The globalized market competition and product patent regime required Indian pharmaceutical firms to upgrade their innovation capabilities to include product development. When developing country firms with such inadequate competitive resources undertake overseas acquisitions, there is an increased possibility for them to seek merger and acquisitions (M&As) as a strategic tool to overcome their existing weakness in the knowledge base (Gupta & Ross, 2001). By helping to acquire innovative capabilities quickly, strategic acquisitions appear to have greater appeal to the latecomer firms over the alternative path of long term investments in in-house R&D with unpredicted results (Deng, 2007; Pradhan, 2008a). Such strategic asset-seeking OFDI

immediately upgrade acquiring firms to a higher scale of technological specialization and diversification and offer a way to overcome the entry barriers that exist in accessing developed countries markets. Added to these positive spinoffs, acquiring Indian firms are likely to derive immediate market expansion, economies of technological and business synergies, and to access new marketing skills, overseas sales distribution networks, and organizational knowledge (Figure 2).



Source: Own construction.

FIGURE 2. **Possible Effects of Overseas Acquisitions**

In view of the multiplicity of benefits that M&As bring with them, it is not surprising that an increasing number of Indian pharmaceutical companies have begun to acquire foreign companies and assets since the last decade. It seems some of these firms are now trying to go beyond their process development based innovation strategy and to enlarge their product baskets via inorganic route of acquisition. A number of studies (Smith, 2000; Pradhan & Abraham, 2005; Pradhan & Alakshendra, 2006; Rajan, 2009; Gubbi et al., 2010) tend to indicate the strategic considerations behind overseas acquisitions of Indian pharmaceutical companies. Pradhan (2008b) provided brief cases of five largest acquirers from Indian pharmaceutical sector where managerial comments on different overseas acquisitions corroborate that these acquirers are using acquisition as a critical strategy for improving their existing technological competencies and also as a means of accessing new markets and facilitating exports from home country.

One of the crucial indications in this process of strategic assets-seeking investments by Indian pharmaceutical firms is the spatial distribution of such investments. In order to acquire superior and strategic technological assets including a broadened range of products, Indian acquirers are expected to disproportionately turn to developed countries rather than developing economies. Developed markets are centres of global technological developments and skills. Therefore, if acquiring Indian pharmaceutical firms are motivated

to acquire advance technologies, then they are likely to concentrate more on picking up assets in these developed markets. In addition, it would be appropriate to say that the choice of Indian pharmaceutical firms selecting developed locations over developing regions may also reflect their desire to enhance their geographical market focus hitherto dominated by developing countries through exports from home and overseas production.

Tables 2 and 3 summarize correspondingly the trends and geographical patterns of overseas acquisitions by Indian pharmaceutical MNEs in the last decade. It can be seen that overseas acquisitions by Indian pharmaceutical firms is a recent phenomenon that is gaining a substantial dimension in terms of value and number of acquiring Indian companies. As many as 52 Indian pharmaceutical companies have undertaken a total of 139 foreign acquisitions valued over US$3.4 billion during 2000–2009 (Table 2). The number of host countries to such acquisition is increasing as well, totaling 33 at the end of June 2009. In terms of geographical focus, Indian pharmaceutical acquisitions spread across a total of 21 developed countries, 11 developing countries and one transition economy (Table 3). Developed region with 92.6 per cent share in total acquisition value is clearly the leading host location for these acquisition activities. Such concentration of Indian pharmaceutical acquisitions in developed regions is indicative of the trend that Indian pharmaceutical firms might be using acquisition as a strategy to overcome their prominent technological shortfall, namely inadequate product development capabilities. Skill-intensive and R&D-oriented developed countries are thus emerging as attractive destinations for Indian firms seeking new products and new markets.

TABLE 2. **Foreign Acquisitions by Indian Pharmaceutical Firms, 2000–09**

Year	Acquisition in USD million	In Number		
	Value	Acquisition deals	Acquiring Indian firms	Target countries
2000	--	2	2	2
2001	--	1	1	1
2002	13	6	3	5
2003	114	6	6	4
2004	68	10	8	8
2005	473	28	16	16
2006	1359	28	20	13
2007	773	19	15	13
2008	585	36	24	14
2009	4	3	3	3
All Years	**3389**	**139**	**52**	**33**

Note: data for 2009 are through June; for all years, the number of target countries and acquiring Indian firms is obtained by single counting of a country and a firm respectively during 2000–09; -- deals values were not disclosed.

Source: Based on dataset constructed from different reports from newspapers, magazines, and financial consulting firms including *Hindu Business Line*, *Economic Times*, *Financial Express*, *Business World*, Grant Thornton India, and ISI Emerging Market.

TABLE 3. **Regional Pattern of Foreign Acquisitions by Indian Pharmaceutical Firms, 2000–09**

Region/country	Acquisition in USD million	In Number	
		Acquisition deals	Acquiring Indian firms
Developing economies	**231 (6.8)**	**24 (17.3)**	**14**
Africa	95 (2.8)	5 (3.6)	5
Tanzania	0 (0.0)	1 (0.7)	1
South Africa	95 (2.8)	4 (2.9)	4
Latin America and Caribbean	96 (2.8)	9 (6.5)	4
Mexico	59 (1.7)	2 (1.4)	2
Argentina	(0.0)	1 (0.7)	1
Brazil	36 (1.1)	5 (3.6)	3
Venezuela	1 (0.0)	1 (0.7)	1
Asia	40 (1.2)	10 (7.2)	8
China	6 (0.2)	6 (4.3)	4
Philippines	(0.0)	1 (0.7)	1
Singapore	14 (0.4)	1 (0.7)	1
Thailand	(0.0)	1 (0.7)	1
UAE	20 (0.6)	1 (0.7)	1
Economies in transition	**20 (0.6)**	**1 (0.7)**	**2**
Russia	20 (0.6)	1 (0.7)	1
Developed economies	**3138 (92.6)**	**114 (82.0)**	**48**
America	758 (22.4)	43 (30.9)	27
Canada	256 (7.6)	3 (2.2)	2
USA	502 (14.8)	40 (28.8)	27
Asia	457 (13.5)	5 (3.6)	4
Israel	454 (13.4)	2 (1.4)	1
Japan	3 (0.1)	3 (2.2)	3
Europe	1848 (54.5)	60 (43.2)	32
Belgium	279 (8.2)	3 (2.2)	3
Bulgaria	7 (0.2)	1 (0.7)	1
Czech Republic	(0.0)	1 (0.7)	1
Denmark	6 (0.2)	1 (0.7)	1
France	86 (2.5)	3 (2.2)	3
Germany	664 (19.6)	10 (7.2)	9
Hungary	(0.0)	2 (1.4)	2
Ireland	150 (4.4)	2 (1.4)	2
Italy	2 (0.1)	6 (4.3)	5
Norway	(0.0)	1 (0.7)	1
Poland	8 (0.2)	3 (2.2)	3
Romania	321 (9.5)	1 (0.7)	1
Spain	66 (1.9)	5 (3.6)	4
Sweden	(0.0)	1 (0.7)	1
Switzerland	77 (2.3)	3 (2.2)	2
UK	182 (5.4)	17 (12.2)	13
Oceania	**75 (2.2)**	**6 (4.3)**	**5**
Australia	75 (2.2)	6 (4.3)	5
Grand Total	**3389 (100)**	**139 (100)**	**52**

Note: Percentage shares are in parentheses; Data for 2009 are through June.

Source: Same as Table 2.

4. Locational Approach to Model Firms' Motivations of Foreign Acquisitions

A number of recent studies have adopted the analysis of locational choice to incorporate diversities of FDI motivations characterizing the rise of emerging market MNEs (e.g. Buckley et al., 2007; Cheung & Qian, 2008; Kolstad & Wiig, 2009; Pradhan, 2010, 2011; Pradhan & Singh, 2010; De Beule, 2010). The locational choice model has allowed these studies to integrate different possible motivations of emerging firms as to why they seek certain host countries for situating their outward investments more than other potential host economies. The present study shall largely follow this locational approach with an eye to gain some insights into Indian pharmaceutical firms' motivations behind overseas acquisitions.

Behrman (1972), Dunning (2000) and UNCTAD (2006) have classified FDI projects into four types by motivations. These are firm-specific motives to seek resources, markets, efficiency and created/strategic assets. Firms pursue FDI driven by any one or combination of these motives and tend to choose locations that integrate these motives effectively with greater favourable resources and institutional endowments. UNCTAD (1998) listed several locational factors for MNE motivations as set out in Table 4 and hypothesized that "host countries that offer what TNCs are seeking, and/or host countries whose policies are most conducive to TNC activities, stand a good chance of attracting FDI" (p. 91). After reviewing the literature and analysis from various global surveys on FDI motivations, UNCTAD (2006) indicated that Chinese FDI, and Indian FDI to some extent, is taking place with the incentive of securing existing markets in developed countries with the parallel objective of acquiring strategic assets to improve firm-specific competitiveness. Especially, Indian MNEs' overseas expansion is mostly for mixed reasons where their FDI is simultaneously for market-seeking and created asset-seeking. For a sample of Indian pharmaceutical firms operating in Brazil, Sweet (2010) found market-seeking activities to be their dominant motivation.

The link between acquiring firms' motivations and location can theoretically be derived from the general theory of industrial location, gravity model of international trade and economic theory of foreign investment. In the location theory (Laundhardt, 1885; Weber, 1929; Hotelling, 1929), firms' industrial location decision is expected to depend on differences in inputs and transportation cost and size of demand at alternative locations. Accordingly, one can see the need for Indian pharmaceutical firms to access critical productive inputs like new technology, skills, and marketing knowledge and to supply to a large size host market as a basis for the specific spatial pattern of their foreign acquisitions. By resorting to the gravity framework (Linnemann, 1966; Deardorff, 1984) of bilateral trade flows, several studies have hypothesized FDI flows to be positively affected by incomes of host and the source country and to be discouraged by the distance between them (e.g. Hufbauer et al., 1994; Bevan & Estrin, 2004; Bénassy-Quéré et al., 2007). These postulations can be relevant for foreign M&As

by national firms as well. In the eclectic theory of FDI (Dunning, 1988, 1998) host countries possessing higher endowment of locational advantages like large markets, high growth, investment friendly policies, adequate infrastructure, etc. are likely to be more favourable host to global FDI flows.

TABLE 4. **MNE Motivation and Location Choice**

FDI projects by MNE motivations	Main economic determinants in host countries
A. Market-seeking	• Market size and per capita income • Market growth • Access to regional and global markets • Country-specific consumer preferences • Structure of markets
B. Resource-seeking	• Availability of natural resources (natural gas, oils, minerals) • Endowment of cheap unskilled labour • Presence of adequate skilled labour force • Level and quality of physical infrastructure (ports, roads, power, telecommunication)
C. Efficiency-seeking	• Lower cost of resources and intermediate inputs, adjusted for productivity of labour resources • Membership of a regional integration agreement conducive to the establishment of regional corporate networks
D. Strategic asset-seeking	• Technological and other created assets (e.g. brand names), including as embodied in individuals, firms and clusters.

Source: Adapted from UNCTAD (1998)

4.1. Empirical specification of the location model

In the backdrop of above theoretical literature and earlier empirical studies on locational choice of emerging multinationals (Buckley et al., 2007; Cheung & Qian, 2008; Kolstad & Wiig, 2009; Pradhan, 2010; Pradhan & Singh, 2010; De Beule, 2010), the present study has specified the cross-country distribution of foreign acquisitions by Indian pharmaceutical firms as a function of a set of host country-specific factors. Gross domestic product (*GDP*), growth of *GDP* (*GDPG*) and per capita *GDP* (*PGDP*) are three host market related variables considered in the empirical specification and are expected to attract more acquisitions by Indian pharmaceutical firms if acquisitions are a strategy for these firms to access new markets. Acquisitions can also be undertaken to facilitate exports to the host market, therefore, host pharmaceutical purchase (*IMP*) from the home country is another possible factor considered in the empirical specification. Host countries with greater technological resources, proxied by the number of residents' applications filings for patent (*PAT*) and trade mark (*TRD*) and higher skill as reflected by school enrolment (*ENRL*), are postulated to be in a better

position to attract acquisitions by strategic resource-seeking Indian pharmaceutical firms.

The host country policy regime towards FDI measured as inward FDI stock as a per cent of GDP (Zhou & Lall, 2005) is included in the estimation as other important locational factors attracting Indian pharmaceutical acquisitions. The remoteness of a host country from India might play a discouraging role as it tends to increase the cost of foreignness and management of business at a distance (Leamer & Storper, 2001) for acquiring pharmaceutical companies. The cultural proximity measured by the existence of a common language (*LAN*) between a host country and India is likely to act as a positive pull factor by reducing transaction costs and hesitation on the part of acquiring Indian pharmaceutical firms.

Therefore, the estimated empirical model in this study can be formulated as follows:

$$ACQ_{iT} = \alpha + \beta_1 GDP_{it} + \beta_2 GDPG_{it} + \beta_3 PGDP_{it} + \beta_4 PAT_{it} + \beta_5 TRD_{it} + \beta_6 ENRL_{it} + \beta_7 IMP_{it} + \beta_8 FDIS_{it} + \beta_9 DIST_i + \beta_{10} LAN_i + u_i \quad \text{(A)}$$

Where,

ACQ_{iT} = Number of acquisitions made by Indian pharmaceutical companies in i^{th} host country during the period T (2002–2008);

GDP_{it} = Natural log of GDP (constant 2000 USD) of i^{th} host country in the year 2002;

$GDPG_{it}$ = Annual percentage change in GDP (constant 2000 USD) of i^{th} host country in the year 2002;

$PGDP_{it}$ = Natural log of per capita GDP (constant 2000 USD) of i^{th} host country in the year 2002;

PAT_{it} = Natural log of resident patent applications per $ billions of current GDP of i^{th} host country in the year 2002;

TRD_{it} = Natural log of resident trade mark applications per $ billions of current GDP of i^{th} host country in the year 2002;

$ENRL_{it}$ = Natural log of gross secondary school enrolment (per cent) of i^{th} host country in the year 2002;

IMP_{it} = Natural log of i^{th} host country's pharmaceutical imports from India as percentage of its total pharmaceutical imports in the year 2002 (1 has been added to the series before taking logs to take account of countries with zero pharmaceutical imports from India);

$FDIS_{it}$ = Natural log of inward FDI stock as percentage of GDP of i^{th} host country in the year 2002;

$DIST_i$ = Natural log of distance in kilometres between India and i^{th} host country.

LAN_i = Takes value of one if a common language is spoken by at least 9% of the population of both i^{th} host country and India, zero otherwise;

u_i = Random errors.

As can be seen from the above empirical setting, our approach has been to see if the initial locational conditions/factors can explain the observed locational pattern of cummulative foreign acquisitions made by Indian pharmaceutical firms in the subsequent period. This method appears to be more appropriate than estimating Equation A for the panel of year-wise cross country distribution of overseas acquistions as the latter is characterized by excessive zeros given that yearly acquistions are confined to just a few countries. For example for the single year 2002 there are just five countries receiving Indian pharmaceutical acquistions out of an estimable sample of 58 host countries.

4.2. Data source, method of estimation and results

The empirical application of Model A has been conducted with the help of data collected from a number of sources. The information on the dependent variable, namely the total number of Indian pharmaceuticals acquisitions by host countries during 2002–2008 is obtained from an in-house dataset constructed from M&A reports in newspapers and magazines like the Hindu Business Line, the Economic Times, the Financial Express and the Business World with supplementary information from consulting firms like Grant Thornton India and ISI Emerging Market. The World Development Indicators (WDI) 2009 has been the basic source for host country data on GDP, GDP growth rate, real per capita GDP and secondary school enrolment ratio. Host country imports of pharmaceuticals from the world and India have been drawn from the United Nations Commodity Trade Statistics Database (COMTRADE). Resident patent filings and applications for trade mark were obtained from the online patent statistics of the World Intellectual Property Organization (WIPO). The information on the inward FDI stock as percentage of GDP is drawn from the online database of the UNCTAD. The CEPII Distance database, 2006 is the primary source for data related to the existence of a common ethnic language between India and host countries and also on geographical distances (in kilometers) between them.

Estimation results and inference

For those models having non-negative counts as the dependent variable, one can use the Poisson maximum likelihood estimation to get consistent coefficient estimates if the dependent variable is equi-dispersed (i.e. the conditional variance equals the conditional mean) and does not possess excessive number of zeros (Cameron & Trivedi 1998; Hilbe, 2007). However, if the Poisson distribution is over-dispersed and extremely censored like ours where the sample variance is 15 times the mean and the 75th percentile value of the distribution is zero as shown in appendix Table 1, the standard Poisson estimator is no longer consistent. Hardin and Hilbe's (2007) censored Poisson method with robust standard errors is an appropriate method that has capacity to account for extra variability and excess zeros in the count data. The present study, therefore, has adopted the censored Poisson method to estimate the coefficients of Model A. Hilbe's (2005) STATA programme, namely *cpoisson* has been used to obtain the empirical results presented below in this paper.

A preliminary diagnostic check like the computation of the simple correlation matrix suggests that the sample suffers from higher degree of collinearity (appendix Table 2). *PGDP* is not only significantly correlated with *GDP* but also with *TRD*, *ERNL*, and *IMP*. A strong correlation can also be seen between *ENRL* and *IMP*. In view of this, the modified Gram-Schmidt procedure (Golub & Van Loan, 1996) has been used to generate orthogonalized versions of explanatory variables by assuming market-related variables to be most important in the order, followed by strategic asset related indicators and then other host factors. In this procedure, orthogonalized variables are created by removing the effects of all the preceding factors (Sribney, 1998).

Table 5 summarizes the results obtained from the censored Poisson estimation of the host country determinants of Indian pharmaceutical acquisitions. There are three sets of results under regressions 1, 2 and 3 respectively related to separate estimations done by considering host country market related factors only, both market and strategic asset characteristics, and all the factors as specified in Model A.

Among the three host market related factors included in regression 1, *GDP* comes up with statistically significant coefficient with predicted positive sign. *GDPG* and *PGDP* both emerge with effects that are statistically not different from zero. Therefore, the initial absolute size of the host market appears to be the most attractive demand factor for acquisitions by Indian pharmaceutical MNEs. This tends to confirm the survey results of the UNCTAD (2006) that found market-seeking motivation as being foremost for a sample of outward investing Indian firms. However, Indian acquirers in the pharmaceutical sector seem to be less concerned with the initial level of per capita income of the host country. Given the relatively low income elasticity of demand for medicines, most Indian pharmaceutical MNEs are limiting their market-seeking objectives to the absolute size of the host market.

In regression 2, strategic asset characteristics of host countries are included along with their market features. Now the *GDP*, *PAT* and *ENRL* all turn up with positive coefficients and are statistically significant. It would indicate that Indian firms from the pharmaceutical sector are focusing their acquisitions on a combination of accessing host market (*GDP*) and strategic resource base (*PAT* and *ENRL*). These companies are found to be attracted by both the intensity of patent activity and general skill in host countries. As Indian acquiring firms possess a narrow range of product development profile, acquiring foreign companies in patent-intensive host countries may be serving a strategic goal. This would reinforce our prediction that overseas acquisitions of Indian pharmaceutical companies are partly driven by a rational vision of a technological upgrade.

The expansion of the estimation to include other possible factors in regression 3 further corroborates the robustness of the role of market-seeking and strategic resource-seeking motivations behind the spatial distribution of Indian pharmaceutical acquisitions. The host market size, resident patent intensity and the degree of skill continue to be important locational factors with significant positive effects. Among the additional variables, *IMP* comes up with a negative sign but is not significant. This

suggests that Indian pharmaceutical acquisitions were directed not necessarily to the host countries that were purchasing more pharmaceuticals from India. The negative coefficient of *IMP* is understandable because Indian pharmaceutical firms concentrated their acquisitions more in developed countries while developing countries are the major traditional export markets for Indian pharmaceuticals.

TABLE 5. **Censored Poisson Estimation of Locational Determinants of Indian Pharmaceutical Acquisitions**

Dependent variable: number of Indian pharmaceutical acquisitions

Independent variables	Regression 1 (Host market factors only)	Regression 2 (Host market and strategic asset factors)	Regression 3 (Host market, strategic asset, policy and other factors)
GDP	2.906110*** (11.49)	2.627682*** (5.00)	3.584235*** (3.60)
GDPG	-0.317024 (1.01)	-0.144057 (0.47)	-0.164420 (0.48)
PGDP	0.095717 (0.45)	0.048937 (0.21)	-0.014913 (0.05)
PAT		0.703258** (2.51)	0.736097** (2.35)
TRD		-0.419338 (1.19)	-0.823366 (1.30)
ENRL		0.779575*** (2.90)	0.890256*** (3.58)
IMP			-0.564703 (0.93)
FDIS			1.772007** (2.39)
DIST			-0.364328 (1.14)
LAN			0.334016 (1.21)
Constant	-3.210670*** (7.54)	-1.237946*** (2.76)	-1.553595*** (3.01)
Wald chi2	133.67	41.63	58.04
Prob > chi2	0.0000	0.0000	0.0000
Log pseudo-likelihood	-59.233554	-26.764917	-15.446522
No. of host countries	184	62	58

Note: Robust z-statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%; all explanatory variables are in orthogonalized form.

The policy variable *FDIS* is significant with a positive sign. It would imply that host country policy regime is an important factor in defining the cross-country distribution of Indian pharmaceutical acquisitions. Indian pharmaceutical firms are likely to locate more of their acquisition projects in host countries with liberal policy towards foreign investment. *DIST* has a negative sign but is not significant. Indian pharmaceutical acquisitions, therefore, are not bounded by physical distance. *LAN* comes up with a positive coefficient but fails to achieve accepted level of significance. It would appear that Indian pharmaceutical acquisitions are taking place due to other considerations than the geographical and cultural proximities with India.

5. Summary and concluding remarks

This paper has examined the foreign acquisition activities of Indian pharmaceutical MNEs both in the general framework of localized technological change in emerging economies and a parsimonious empirical model of FDI location. The transition of a number of emerging economies from a phase of adaptive R&D based on imported technologies in the past to the accumulation of indigenous innovative capabilities in the 1980s has its limitations as much of these innovative activities centered more on process developments than expanding product development capabilities. The adoption of competitive openness policies in the 1990s by many emerging economies brought about a sharp growth in overseas acquisitions by their national firms. Such foreign acquisitions by emerging economies firms with weak product development capabilities are likely to be for accessing new products, technologies, brands and skills needed for facing immediate market competition, besides accessing new markets.

The changing profile of growth and technological capabilities in Indian pharmaceutical industry largely highlights the similar propositions obtained from the literature of technological change in emerging economies. Despite the initial constraints of being a developing country and non-existent productive base in the modern pharmaceutical sector, India could build a very competitive pharmaceutical industry. The strategic government policies including public sector drug production, adoption of short duration process patent regime and strong monitoring of activities of foreign companies, resulted in significant growth of domestic investment in the pharmaceutical sector and increased local technological activities mainly in the form of cost-effective process development. This led to a rise of domestic productive capacity to satisfy growing demand for drugs and prompted a consistent export surge to overseas markets.

It is in the 1990s that the issue of a broad-based innovation strategy for long run growth of Indian pharmaceutical firms started attracting corporate and expert attention. The liberalization measures and a product patent regime made it imperative for Indian pharmaceutical firms to enlarge their innovation strategy towards product-oriented R&D. Many large Indian pharmaceutical companies realized these challenges and went for suitable measures like putting more resources in product and process development. In addition, some of these firms have also opted for overseas acquisition as a conscious

corporate strategy since the last decade. It is believed that the recent boom in overseas acquisitions by these firms partially represents their strategic motivation for acquiring new products, skills and technologies to overcome their existing inadequate product development capabilities. The concentration of Indian pharmaceutical acquisitions in innovation-driven developed countries tends to corroborate the above strategic postulation.

The empirical results from the locational analysis based on the censored Poisson regression have generally tended to further validate the role of strategic resource-seeking motivations behind foreign acquisitions of Indian pharmaceutical MNEs. The foreign acquisitions of these firms have been found to be more attracted to host countries that offer a large domestic market, strong patenting activities, skilled human resource base and that pursue a liberal foreign investment regime. Strategic asset-bases of host countries like the residents' patents and skills are, thus, appear to be increasingly driving the geographical pattern of foreign acquisitions of Indian pharmaceutical firms holding the domestic market size (GDP) and policy regime constant. As Indian pharmaceutical firms had inadequate product development capabilities on the eve of the openness policies in the early 1990s, their acquisitions in patent- and skill-intensive countries is likely to be a strategy to improve their competitive advantages by accessing new technologies and products. In this sense overseas acquisition can be seen as a means of overcoming limited product development capabilities that characterize the majority of Indian pharmaceutical companies. Overall, these results support the UNCTAD (2006) observation that Indian FDI is mostly for a mixed purpose of accessing new markets and created assets.

Although overseas acquisition can be important for enhancing firm-specific technological capabilities and for entering into new markets, they are also challenging for acquiring Indian pharmaceutical firms in a number of ways. Investment requirements in acquisition are quite substantial and not all Indian pharmaceutical firms have access to such resources. Especially, small- and medium-sized pharmaceutical units that dominate the Indian pharmaceutical industry shall not be able to benefit from the acquisition strategy. They do not have financial, technological and skill resources to undertake overseas acquisition to improve their product portfolio. Therefore, the scope and opportunities that are associated with acquisition strategy are limited to relatively large Indian pharmaceutical companies.

Since Indian pharmaceutical companies are new to global production, overseas acquisition involves significant market and operational risks. In the preparatory stage, the challenge is to decide on target markets and to identify target companies that can fit well into the requirements of Indian acquiring companies. In addition, Indian firms are required to determine the transaction value, negotiate with potential target companies and obtain information related to host country legal and environment clearances. Although financial accounting and consultancy firms help in these efforts, Indian firms should have adequate in-house skills to manage these issues more realistically. Insufficient knowledge of host country laws, regulatory delays, strong legal monitoring

in host developed countries related to manufacturing process, and quality of drugs and unexpected changes therein, rapid changes in demand and prices, growing competition, etc., represent high risk entailed in overseas acquisition.

After acquisition, an Indian firm faces operational challenge to carry forward acquired production activities in foreign countries. The immediate issue is the post-acquisition integration that addresses the theme of harmonizing different work cultures, managerial practices, employment policies, etc., successful integration of the acquired overseas units and putting them to efficient production. The scope for absorbing newly acquired foreign knowledge and benefiting from scale expansion clearly depends on the technological capabilities of acquirers themselves.

It is clear that without a well designed acquisition strategy, acquiring Indian pharmaceutical companies may not realize intended benefits from such activities. As long as Indian acquiring firms are aware of the potential risks involved in acquisition and well prepared to face such eventualities, overseas acquisitions can contribute to their greater geographical and economic diversification and upgrading of their technological capabilities significantly.

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Appendix

TABLE 1. **Summary of the dependent variable**

Number of Indian pharmaceutical acquisitions by host countries			
Percentiles	No.	Std. Dev.	3.294206
75%	0	Mean	0.719577
90%	2	Variance	10.8518
95%	3	Obs.	189
99%	17		

Note: Calculation is based on total number of host countries.

TABLE 2. **Correlation matrix**

	GDP	*GDPG*	*PGDP*	*PAT*	*TRD*	*ENRL*	*IMP*	*FDIS*	*DIST*	*LAN*
GDP	1.0000									
GDPG	-0.1573	1.0000								
PGDP	0.5537	-0.3551	1.0000							
PAT	0.0975	0.1754	0.1406	1.0000						
TRD	-0.3820	0.3010	-0.5791	0.0939	1.0000					
ENRL	0.2522	-0.1918	0.7075	0.4880	-0.2004	1.0000				
IMP	-0.3307	0.1992	-0.6719	-0.2358	0.3781	-0.5666	1.0000			
FDIS	-0.1974	0.1960	0.2069	-0.1203	-0.1476	0.1592	-0.0879	1.0000		
DIST	0.2061	-0.3169	0.4216	-0.3832	-0.0563	0.2457	-0.2101	0.2464	1.0000	
LAN	0.1260	-0.0117	0.2825	-0.0978	-0.2847	0.0978	0.0062	0.3240	0.1874	1.0000

Note: obs=58.